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REMARKS

Applicants sincerely appreciate the examination of the present application as evidenced by the Office Action of August 17, 2009 (hereinafter, "the Office Action"). Applicants further appreciate the willingness of the Examiner to participate in a telephone interview as discussed further below.

Claims 1-5, 8-12, 19, 27-30, 38 and 43 stand rejected under 35 U.S.C. § 102(b) as being anticipated by WIPO Publication WO 00/75254 to Bain et al. (hereinafter "Bain"). Claims 6, 7, 13, 15-21, 26, 39, 40 and 42 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Bain. Claims 16 and 17 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Bain in view of U.S. Patent No. 6,936,644 to Gilleo (hereinafter "Gilleo"). Claim 18 stands rejected under 35 U.S.C. § 103(a) as being unpatentable over Bain in view of U.S. Patent Publication No. 2002/0007910 to Bennett et al. (hereinafter "Bennett"). Claim 20 stands rejected under 35 U.S.C. § 103(a) as being unpatentable over Bain in view of U.S. Patent Publication No. 2004/0014860 to Meier et al. (hereinafter "Meier"). Claims 2-30, 40 and 43 stand rejected under 35 U.S.C. § 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which Applicant regards as the invention.

The Examiner has indicated that claims 22-25 would be allowable if rewritten to overcome the rejections under 35 U.S.C. § 112, second paragraph, and to include all of the recitations of the base claims and any intervening claims.

In view of the foregoing amendments and the following remarks, reconsideration and withdrawal of the outstanding rejections to the present application are respectfully requested.

Interview Summary

Applicants would like to thank Examiner Osele for the courtesy extended to Applicants' legal representatives, Dr. Shawna Cannon Lemon and Adam Rucker, during the telephone interview conducted on November 4, 2009. Applicants concur with the Interview Summary dated November 5, 2009.

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Claim Rejections Under 35 U.S.C. § 102(b)

Claims 1-5, 8-12, 19, 27-30, 38 and 43 stand rejected under 35 U.S.C. § 102(b) as being anticipated by Bain.

Anticipation under 35 U.S.C. §102 requires that **each and every element** of the claim be found in a single prior art reference. *W. L. Gore & Associates Inc. v. Garlock, Inc.*, 721 F.2d 1540, 1554, 220 U.S.P.Q. 303, 313 (Fed. Cir. 1983). A finding of anticipation further requires that there must be **no difference between the claimed invention and the disclosure of the cited reference** as viewed by one of ordinary skill in the art. *See Scripps Clinic & Research Foundation v. Genentech Inc.*, 927 F.2d 1565, 1576, 18 U.S.P.Q.2d 1001, 1010 (Fed. Cir. 1991). Additionally, the cited reference must be enabling, thereby placing the allegedly disclosed matter in the possession of the public. *In re Brown* , 329 F.2d 1006, 1011, 141 U.S.P.Q. 245, 249 (C.C.P.A. 1964). Thus, the prior art reference must adequately describe the claimed invention so that a person of ordinary skill in the art could make and use the invention.

Applicants respectfully submit that Bain fails to anticipate the rejected claims. Not only does Bain fail to describe all of the recitations of the various claims, it describes compositions and methods that stand in stark contrast to those of the claimed invention. Accordingly, the pending 102(b) rejections should be reconsidered and withdrawn.

I. **Independent Claims 1, 4, and 38 are Patentable over Bain**

Claim 1, as amended, recites:

A method of bonding and debonding two or more surfaces or supports or layers of an adhesive system, the method comprising:

(i) providing a first power level of thermal radiation and/ or thermal conduction and/or thermal energy which passes through the adhesive composition so the contents of a first set of thermoexpandable microspheres leach or migrate through their porous shells into the matrix of the composition and **wherein the first set of thermoexpandable microspheres is associated with curing and bonding**; and

(ii) providing a second power level of thermal radiation and/ or thermal conduction and/or thermal energy which concentrates on the adhesive surfaces so as to expand a second set of thermoexpandable microspheres in the adhesive and/or cleaner and/or primer layers, thereby weakening the adhesive forces in the interface of the adhesive system.

Claim 4 likewise recites “a first set of thermoexpandable microspheres being associated with curing and bonding.” Claim 38, which has been amended to include the recitations of canceled claim 39, contains similar recitations.

Bain does not describe microspheres associated with curing and bonding. Instead, Bain discusses the use of thermoexpandable microspheres that expand to weaken *existing* adhesive forces and facilitate separation of the bonded surfaces:

Heat activation of the microcapsules causes the beads/fibres to thermoexpand thus creating pressure along the rim of the glazing. This in effect reduces the viscosity and the shear or tear stress of the adhesive material. In addition, heat activation or expansion of the microcapsules reduces the cohesive stress and/or interfacial adhesive bonding of the adhesive film between two bonded surfaces, typically the frame and glass layers. The reduction in either cohesive stress and interfacial adhesion, or both together, contribute to reduce failure stress so as to facilitate removal of the glued glazing from the frame once the microcapsules have expanded at the specific temperature range and range of time, typically no more than 5 minutes. The compositions of the present invention thus allow[] removal of glued glazing by virtue of a reduction in chemical and/or physical bonding of the adhesion at the interface between the adhesive and the two bonded surfaces (glass and frame surfaces). In other words, adhesion failure can only occur at the interface of the two bonded surfaces due to the effect of the expanded microcapsules. In use, and once the microcapsules have been activated[,] the reduction in cohesive forces of the adhesive material and the bonding interface between material and layers in addition to the expansion of the adhesive material itself, results in loosening of the whole of the adhesion of the glazing to a frame so that a windscreens or glazing can easily be lifted up and removed therefrom.

Bain, page 8, lines 4–22 (emphasis added). As noted by the accompanying Declaration of Eric Papon, Ph.D. (hereinafter “Papon Declaration”), there is simply no suggestion that Bain’s microspheres might be involved in the bonding process. *See* Papon Declaration, page 2. Instead, Bain “treats the expanding microspheres like a spring mechanical pressure actuator in the volume of the adhesive state and like a ‘bombing’ actuator at the interfaces between two layers.” Bain, page 4, lines 19–21.

Moreover, Bain’s description of the microspheres’ contents makes it clear that the microspheres are *not* “associated with curing and bonding.” Each of Bain’s microspheres

“encapsulates at least one expandable gas or volatile expandable agent or an explosive material.” Bain, page 5, lines 18–20. “Preferably, the microcapsules encapsulate more than one material, ideally the material is selected from the group consisting of an expanding agent, and agent capable of sublimation, water, an explosive agent or an activator agent.” Bain, page 6, lines 12–14. These materials described by Bain acts to weaken the adhesive forces between the bonded surfaces:

- Expanding agent, agent capable of sublimation: “It will be appreciated that the expanding agent inside the capsule is capable of activating a foaming process of the adhesive composition and that the agent capable of sublimation is to allow the composition to expand under certain specified conditions. Both of these processes will . . . **contribute to facilitating lifting and ease of removing fixed glazing.**” Bain, page 6, lines 26–31 (emphasis added); *see also* Papon Declaration, page 3.
- Water: “The inclusion of water in the microcapsules is to **allow the adhesive composition to weaken** in certain conditions.” Bain, sentence spanning pages 6 and 7 (emphasis added).
- Explosive agent: Like an expanding agent or an agent capable of sublimation, the explosive agent would cause the physical expansion of the adhesive composition, thereby leading to **a reduction in the adhesive forces between the two surfaces**. *See* Bain, page 4, lines 18–21 (emphasis added); *see also* Papon Declaration, page 3.
- Activator agent: “[T]he presence of an activator agent is to crosslink or polymerise the adhesive composition **whereby shrinkage occurs and the adhesive composition weakens.**” Bain, page 7, lines 1–3; *see also* Papon Declaration, page 3. “A curing agent . . . capable of shrinkage” (Bain, page 8, lines 1–2) would likewise lead to shrinkage and weakening of the adhesive bond. Indeed, releasing a “curing agent” into the already-set adhesive would not only cause the adhesive agent to shrink, but would also cause it to become “harder and more brittle, thereby reducing the stability of the adhesive bond.” Papon Declaration, page 3.

Bain provides for a “fast cure agent or catalyst, whereby the adhesive composition is rapidly set” (page 6, lines 4–5), but it does not teach that such an agent is to be encapsulated *within* microspheres. During the telephone interview referenced above, the Examiner pointed to page 5, lines 7–10 of Bain as providing the necessary teaching. Yet, as noted on pages 3 and 4 of the Papon Declaration, that passage appears to argue **against** the inclusion of a curing agent within Bain’s microspheres. According to the cited passage, Bain’s adhesive composition “*additionally* comprises a fast cure agent or catalyst, whereby the adhesive composition is rapidly cured or set.” Bain, page 6, lines 4 and 5 (emphasis added). Notably, the next sentence declares that the composition should also include a “colouring agent so that the cured composition is black.” Bain, page 6, lines 5 and 6. In other words, Bain’s adhesive composition advocates including both a curing agent and a colouring agent *in addition to* the adhesive agent and thermoexpandable microspheres. As such, **Bain should not be read to suggest that its “fast cure agent or catalyst” is actually encapsulated within its thermoexpandable microspheres.**

Indeed, Bain’s adhesive composition and methods would not function appropriately if the fast cure agent was encapsulated in its microspheres. If it were so positioned, the fast cure agent could not drive the curing process until the microspheres were activated. Such a mechanism would be futile and counterproductive—the curing process would be completely thwarted by the contemporaneous release of expanding agents, explosive agents, activator agents, etc.

Inasmuch as Bain lacks “a first set of thermoexpandable microspheres being associated with curing and bonding,” it likewise fails to describe each and every recitation of the claimed invention. Accordingly, it cannot be said that there is no difference between the claimed invention and the disclosure of the cited reference. Applicants therefore respectfully submit that Bain fails to anticipate independent claims 1, 4, 29 and 30 and request the reconsideration and withdrawal of the pending §102(b) rejections thereof.

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II. Dependent Claims 2-3, 5, 8-12, 19, 27-29, and 43 are Patentable over Bain

Claims 2, 3, 5, 8-12, 19, 27-29 and 43 are patentable over Bain at least by virtue of their depending from an allowable claim. In addition, Applicants note that several of the aforementioned dependent claims are separately patentable over Bain.

For example, with regard to claim 8, Bain fails to describe a method wherein “microspheres associated with curing and bonding have a larger cross sectional diameter than those associated with debonding.” Bain merely describes “a mixture of microcapsules of different diameter or shell thickness” (page 7, lines 15-16); Bain does not specify which species of microspheres are to be bigger and which are to be smaller. Thus, even if one skilled in the art erroneously read Bain as teaching “a first set of thermoexpandable microspheres being associated with curing and bonding,” he/she would be unable to glean from Bain any advice as to whether those microspheres should be larger or smaller than their debonding counterparts.

As to claim 19, although Bain does describe using a “colouring agent so that the cured composition is black” (page 6, lines 5–6), Bain does not teach that its thermoexpandable microspheres are to be “coated in a black material.” Indeed, as noted above, Bain indicates that the colouring agent is simply an “additional” ingredient that is added to the overall composition. Applicants respectfully submit that one skilled in the art would read Bain to convey that the colouring agent is supposed to be mixed into the adhesive agent (just like the microsphere powder described at page 5, lines 25–31). Bain’s microspheres are therefore not “coated in a black material” except insofar as they happen to be dispersed throughout the adhesive agent alongside the colouring agent.

With regard to claim 28, the Applicants are not aware of any passage in Bain that describes the depth, breadth, thickness or width of the adhesive composition, and the Examiner points to no such passage. Accordingly, the Examiner has failed to establish a *prima facie* case of anticipation under 35 U.S.C. § 102(b), and the rejection of claim 28 should be reconsidered and withdrawn.

Likewise, the Examiner failed to point to any passage in Bain that purportedly anticipates claim 29. Accordingly, the rejection of claim 29 should be withdrawn.

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III. New Claims 44 and 45 are Patentable over Bain

Applicants note that newly-added claims 44 and 45 are patentable over Bain at least by virtue of their depending from claim 1, which is itself patentable over Bain for at least the reasons discussed above.

Moreover, Bain's adhesive compositions/methods do not include the use of microwires. For this additional reason, Bain fails to anticipate claims 44 and 45.

Claim Rejections Under 35 U.S.C. § 103(a)

Claims 6, 7, 13, 15, 21, 26, 39, 40 and 42 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Bain. Claims 16 and 17 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Bain in view of Gilleo. Claim 18 stands rejected under 35 U.S.C. § 103(a) as being unpatentable over Bain in view of Bennett. Claim 20 stands rejected under 35 U.S.C. § 103(a) as being unpatentable over Bain in view of Meier.

In *KSR Intern. Co. v. Teleflex Inc.*, 550 U.S. 398 (2007), "the Supreme Court reaffirmed the familiar framework for determining obviousness as set forth in *Graham v. John Deere Co.*" Examination Guidelines for Determining Obviousness Under 35 U.S.C. § 103 in View of the Supreme Court Decision in *KSR International Co. v. Teleflex, Inc.* (Federal Register Vol. 72, No. 195, 57526-57535, 57526). Hence, and as long established under that framework, to establish a *prima facie* case of obviousness, three requirements must be satisfied. First, the prior art relied upon, coupled with the knowledge generally available in the art at the time of the invention, **must contain some suggestion or incentive that would have motivated one of ordinary skill in the art to modify a reference or to combine references.** *In re Oetiker*, 24 U.S.P.Q.2d 1443, 1446 (Fed. Cir. 1992); *In re Skinner*, 2 U.S.P.Q.2d 1788, 1790 (Bd. Pat. App. & Int. 1986). Second, the proposed modification or combination of the prior art **must have a reasonable expectation of success**, determined from the vantage point of the skilled artisan at the time the invention was made. See *Amgen, Inc. v. Chugai Pharm. Co.*, 927 F.2d 1200, 1209, 18 U.S.P.Q.2d 1016, 1023 (Fed. Cir. 1991). Third, the prior art reference or combination of references **must teach or suggest all of the limitations of the claims.** See *In re Wilson* 424 F.2d 1382, 1385, 165

U.S.P.Q. 494, 496 (CCPA 1970) ("All words in a claim must be considered in judging the patentability of that claim against the prior art"). "[A] patent composed of several elements is not proved obvious merely by demonstrating that each of its elements was, independently, known in the prior art." *KSR*, 550 U.S. at 418. Furthermore, "**when the prior art teaches away from combining certain known elements, . . . combining them is more likely to be nonobvious.**" *Id.* at 416 (emphasis added).

As noted above, Bain fails to describe "a first set of thermoexpandable microspheres being associated with curing and bonding." Indeed, Bain teaches *against* the use of thermoexpandable microspheres for curing and bonding. Bain's description of the mechanisms by which its thermoexpandable microspheres operate is a panoply of destructive forces: "creating pressure along the rim of glazing," "reduc[ing] the viscosity and the shear or tear stress of the adhesive material," "reduc[ing] the cohesive stress and/or interfacial adhesive bonding of the adhesive film between two bonded surfaces," "reduc[ing] failure stress", and "expand[ing] of the adhesive material." See Bain, page 8, lines 5–22. Elsewhere, Bain "treats the expanding microspheres like a spring mechanical pressure actuator in the volume of the adhesive state and like a 'bombing' actuator at the interfaces between two layers." Bain, page 4, lines 19–21. Thus, Bain provides no teaching or suggestion whereby one of ordinary skill in the art might have been motivated to create a method or composition of the claimed invention. Bain, therefore, cannot be relied upon to teach or suggest all of the recitations of the pending claims.

None of the secondary references cited by the Examiner remedy this defect in Bain's teaching. Accordingly, one of ordinary skill in the art would not have been motivated to modify Bain in such a way as to arrive at a composition/method of the claimed invention.

Applicants therefore respectfully submit that each of the pending claims is patentable over Bain, Gilleo, Bennett and Meier.

I. Claims 6, 7, 13, 15, 21, 26, 40 and 42 are Patentable over Bain

Bain fails to anticipate “a first set of thermoexpandable microspheres being associated with curing and bonding.” It likewise fails to render such microspheres obvious.

At least because Bain fails to teach or suggest the use of microspheres associated with curing and bonding, it cannot properly be relied upon to render obvious independent claims 1, 4, 38 and 40. Accordingly, dependent claims 6, 7, 13, 15, 21, 26, and 42 are patentable over Bain at least by virtue of their depending from an allowable claim. Moreover, several of the aforementioned dependent claims are separately patentable over Bain.

Claim 6 recites a method wherein “the first set of thermoexpandable microspheres comprise a co-polymeric shell which encapsulates a curing agent or catalyst mixed with an expanding agent.” Bain clearly teaches that expanding agents are included in its microspheres for the purpose of weakening the adhesive bond and “facilitating lifting and ease of removing fixed glazing.” *See Bain, page 6, lines 26–31.* It thus seems unlikely that Bain would have motivated one of ordinary skill in the art to encapsulate a curing agent (as described in the present application) and an expanding agent within the same thermoexpandable microsphere. As such, Bain does not render claim 6 obvious.

Claim 7 is separately patentable over Bain at least by virtue of its dependency from claim 6.

With regard to claim 13, Bain’s failure to teach or suggest “a first set of thermoexpandable microspheres being associated with curing and bonding” naturally leads to its failure to teach the use of an activation temperature that is 20-100 °C lower for such microspheres as compared to their debonding counterparts. For this reason alone, claim 13 is separately patentable over Bain. Furthermore, although Bain does describe using “different heat activation temperatures” (page 7, lines 15–17), it is silent as to what an appropriate difference range would be, and given Bain’s preferred activation temperatures—ideally between 120 and 150 °C—it is hard to imagine that one of ordinary skill in the art would have been motivated to select a temperature difference between 20 and 100 °C (as recited in claim 13). *See Bain, page 7, lines 15–17.*

As to claim 15, Bain fails to teach or suggest a method wherein “microspheres encapsulating a curing agent of catalyst constitute[e] about 2-3%, by weight, of the composition.” On pages 5 and 6 of the Office Action, the Examiner points to Bain, page 7, lines 9–10 as supplying the necessary teaching. Yet, that passage merely states that “the composition comprises microcapsules in the range of 1-30% by volume, more preferably in the range of 2-10% by volume.” Even assuming that the Examiner is correct in his assertion that “[o]ne of ordinary skill in the art would have realized that the lower end of the disclosed range would be expected to correlate to 2-3% by weight” (Office Action, sentence spanning pages 5 and 6), the cited passage cannot render claim 15 obvious because it relates only to the *total* amount of Bain’s microspheres, not the amount of microspheres containing a given ingredient (expanding agent, explosive agent, etc). Thus, even if one erroneously assumed that some of Bain’s microspheres encapsulate a curing agent, Bain still does not provide any teaching with regard to what percentage of the composition should be made up of those microspheres.

The rejections of claims 21 and 26 should be withdrawn because the Examiner neither pointed to a passage in Bain to support a *prima facie* case of obviousness, nor supplied any independent rationale to support such a finding.

II. Claims 16 and 17 are Patentable over Bain in View of Gilleo

Applicants respectfully submit that one of ordinary skill in the art would not have been motivated to combine Bain and Gilleo in the manner suggested by the Examiner on pages 6 and 7 of the Office Action. Gilleo uses infrared radiation to “disintegrate” the walls of the microspheres, thereby releasing their contents. *See, e.g.,* Col. 7, lines 6–13. In contrast, Bain’s “[m]icrospheres do not break/fracture their shells in the expanding state[,] maintaining their integrity, so that an activated composition comprises intact microspheres and microcapsules which have released their contents into the matrix of the composition.” Bain, page 6, lines 21–24. If Bain’s microspheres were modified for use with Gilleo’s infrared radiation (by adding an infrared absorber, as suggested at Col. 7, lines 6–8), they would disintegrate upon activation and could no longer fulfill their fundamental purpose: acting like

a “spring mechanical pressure actuator” or a ““bombing’ actuator.” *See* Bain, page 4, lines 19–21. Thus, Bain actually teaches against modifying its microspheres in such a way as to render them susceptible to the infrared radiation used in Gilleo.

Moreover, even if one of ordinary skill in the art were somehow motivated to combine Bain and Gilleo, he/she could still not have created the method of claim 18. Like Bain, Gilleo describes microspheres that are used to cure an adhesive agent. *See, e.g.*, Gilleo, Abstract. It provides no teaching or suggestion that might have motivated a skilled artisan to introduce “a first set of thermoexpandable microspheres being associated with curing and bonding” into Bain’s composition. Accordingly, Gilleo cannot remedy the defects in Bain’s teaching.

III. Claim 18 is Patentable over Bain in View of Bennett

As noted above, Bain fails to teach or suggest “a first set of thermoexpandable microspheres being associated with curing and bonding.” Coating Bain’s adhesive composition onto a backing sheet, as suggested by the Examiner on page 7 of the Office Action, would not render the method of claim 18 obvious—the resultant “tape” would not comprise “a first set of microspheres being associated with curing and bonding.” Thus, even if the suggested modification would have been obvious to one of ordinary skill in the art at the time of the invention, he/she could still not have created the method of claim 18.

IV. Claim 20 is Patentable over Bain in view of Meier

As noted above, Bain fails to teach or suggest “a first set of thermoexpandable microspheres being associated with curing and bonding.” Adding paramagnetic or ferromagnetic nanoparticles into the microspheres of Bain, as suggested by the Examiner on pages 7 and 8 of the Office Action, does not render the method of claim 20 obvious. Such a modification would merely provide an additional means by which Bain’s debonding microspheres could be ruptured. Thus, even if the suggested modification would have been obvious to one of ordinary skill in the art at the time of the invention, he/she could still not have created the method of claim 20.

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Claim Rejections Under 35 U.S.C. § 112, second paragraph

Claims 2-30, 40 and 43 stand rejected under 35 U.S.C. § 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which Applicants regard as the invention. Claim 30 has been canceled. Applicants have amended claims 2-29, 40 and 43 and respectfully submit that each is currently in condition for allowance.

CONCLUSION

Applicants respectfully submit that all pending claims in the present application are in condition for allowance, and a Notice of Allowance is respectfully requested in due course. The Examiner is encouraged to contact the undersigned attorney by telephone should any additional issues need to be addressed.

Respectfully submitted,



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